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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/831,139
Filing Date: June 21, 2001
Appellant(s): MUELLER, FRIEDRICH

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EXAMINER'S ANSWER

This is in response to the appeal brief filed 11/19/2007 appealing from the Office action mailed 01/22/2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

This appeal involves claims 11-14.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,864,603   HAAVISTO   1-1999

5,22,121   SHIMADA   6-1993

Markowitz, J. A. "Using Speech Recognition" Prentice Hall PTR, 1996, pp. 35-38.

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1.   Claims 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Haavisto et al. (U.S. Patent 5,864,603), hereinafter referred to as Haavisto.

Regarding **claim 11**, Haavisto discloses an apparatus for controlling a telephone

with voice commands. Haavisto's apparatus includes the following:

• a speech recognition device configured to recognize acoustic objects, where the

acoustic objects comprise at least one of individual letters, combinations of letters or

control commands (col. 4, lines 23-27; Figs. 1-3 indicates various states during the

speech recognition; col. 6, describes various commands that are recognized: "Cancel,"

"Yes," "No"); and

- an acoustic device for acoustic output or optical display of recognized acoustic

objects (col. 6, lines 23-45, responds "Was the number"), wherein

- if an acoustic object is incorrectly recognized, the speech recognition device

subsequently recognizes a first control command causes a speech recognition

algorithm to expect repeated utterance of the incorrectly recognized object (col. 6, line

33-57, answers "No" where the phone will go into state voice control; if the recognition

failed .... The phone responds "Number again, please"), and

- a second control command causes the speech recognition algorithm to output at

least one further acoustic object (col. 6, line 33-57, the phone responds "Number again,

please").

Haavisto also describes the recognition of an acoustic object with multiple

possible matches associated with probabilities (col. 4, lines 10-23, multiple phone

numbers), but Haavisto does not specifically disclose (as part of a particular

embodiment) "a recognition probability of the at least one further acoustic object is less

than the recognition probability of the previously output acoustic object, but greater than

the recognition probability of other acoustic objects." However the examiner contends

that these concepts were well-known in the art as taught in the prior art section of

Haavisto.

Haavisto in the prior art section describes prior teachings where during the

recognition process several potential recognition objects are identified including a best

result, a next best result, etc. where the candidates are arranged in order (col. 2, lines

28-39; "if the user gives a negative answer ..., the phone selects the result that is the

second best match to the recognition" and "as a response to a voice command ... the

telephone indicates ... the next best candidate, when the candidates have been

arranged in order").

Therefore, it would have been obvious to one having ordinary skill in the art at

the time the invention was made to modify Haavisto by specifically providing the feature,

as taught by Haavisto's prior art, because it was well known in the art at the time of

invention as an improvement when selecting from several possible recognition results

(Haavisto, col. 2, line 27-32).

Regarding **claim 12**, Haavisto in view of Haavisto's prior art teaches everything

claimed, as applied above (see claim 11). In addition, Haavisto teaches "recognition of

a third control command causes the speech recognition algorithm to assess the last-

output object as correctly recognized, ends any output of further objects and/or triggers

a function corresponding to the recognized control command" (col. 6, lines 34-40; the

user may respond "Yes" ..., there follows a transition to a state Dialing).

Regarding **claim 13**, Haavisto discloses method for controlling a telephone with

voice commands. Haavisto's method includes the following steps:

• providing a recognition algorithm to recognize acoustic objects, where the acoustic

objects comprise at least one of individual letters, combinations of letters or control

commands (col. 4, lines 23-27; Figs. 1-3 indicates states during the speech recognition;

col. 6, describes various commands that are recognized: "Cancel," "Yes," "No")and

• acoustically outputting or displaying recognized acoustic objects (col. 6, lines 23-45,

responds "Was the number"),

• wherein if an acoustic object is incorrectly recognized, the recognition algorithm

subsequently recognizes a first control command causes a speech recognition

algorithm to expect repeated utterance of the incorrectly recognized object (col. 6, line

33-57, answers "No" where the phone will go into state Voice control; if the recognition

failed .... The phone responds "Number again, please"), and

• a second control command causes the speech recognition algorithm to output at

least (col. 6, line 33-57, the phone responds "Number again").

Haavisto also describes the recognition of an acoustic object with multiple

possible matches as associated with a probabilities (col. 4, lines 10-23, multiple phone

numbers), but Haavisto does not specifically disclose (as part of a particular

embodiment) "one further acoustic object, wherein a recognition probability of the at

least one further acoustic object is less than the recognition probability of the previously

output acoustic object, but greater than the recognition probability of other acoustic

objects, or the further acoustic object is provided by a sequence of entries in a storage

device of the device." However the examiner contends that these concepts were well-

known in the art as taught in the prior art section of Haavisto.

Haavisto in the prior art section describes prior teachings where during the

recognition process several potential recognition objects are identified including a best

result, a next best result, etc. where the candidates are arranged in order (col. 2, lines

28-39; "if the user gives a negative answer ..., the phone selects the result that is the

second best match to the recognition" and "as a response to a voice command ... the

telephone indicates ... the next best candidate, when the candidates have been

arranged in order"; furthermore the recognition candidates will necessarily be stored in

memory during the recognition process).

Therefore, it would have been obvious to one having ordinary skill in the art at

the time the invention was made to modify Haavisto by specifically providing the feature,

as taught by Haavisto's prior art, because it was well known in the art at the time of

invention as an improvement in recognition accuracy when selecting from several

possible recognition results (Haavisto, col. 2, line 27-32) and an increase in user

satisfaction from the improved performance.

Regarding **claim 14**, Haavisto in view of Haavisto's prior art teaches everything

claimed, as applied above (see claim 13). In addition, Haavisto teaches "the recognition

of a third control command causes the speech recognition algorithm to assess the last-

output object as correctly recognized, ends any output of further objects and/or triggers

a function corresponding to the recognized control command" (col. 6, lines 34-40; the

user may respond "Yes" ..., there follows a transition to a state Dialing).

(10) Response to Argument

2.   Appellant asserts on p 6:

A. **HAAVISTO fails to teach or suggest, among other limitations of Appellant's claims, a first control command causes a speech recognition algorithm to expect repeated utterance of the incorrectly recognized object, and a second control command causes the speech recognition algorithm to output at least one further acoustic object, as required by Appellant's independent claims 11 and 13.**

More particularly, Appellant's independent claim 11 recites, among other limitations, a data processing system for recognizing speech that includes a speech recognition device configured to recognize acoustic objects. Appellant's claim 11 additionally requires, among other limitations, that the acoustic objects include at leas~ one of individual letters, combinations of letters or control commands. Further, the invention of claim 11 additionally requires, among other limitations, an acoustic device for acoustic output or optical display of recognized acoustic objects. If an acoustic object is incorrectly recognized, the speech recognition device of *Appellant's claim 11 subsequently recognizes a first control command that causes a speech recognition algorithm to expect repeated utterance of the incorrectly recognized object and a second control command that causes the speech recognition algorithm to output at least one further acoustic object. A recognition probability of the at least one further acoustic object of claim.11 is less than the recognition probability of the previously output acoustic object, but greater than the recognition .probability of other acoustic objects.* (Italics added)

HAAVISTO teaches the recognition of multiple commands (e.g. "NO", "YES",

"CANCEL" see col. 6, and Table 2, note the presence of a "NEXT" command in the

table). After the recognition of the user's input the phone responds "Was the number"

and then lists the recognition result (col. 6, lines 27-33). If user responds "YES" the

number is dialed, and if the user responds "NO" the user is requested to repeat the

number (i.e., "causes a speech recognition algorithm to expect repeated utterance ...";

col. 6, lines 35-57).

Although HAAVISTO teaches multiple voice commands (see Table 2) that

respond with acoustic outputs (the recognition results and other prompts), HAAVISTO

does not specifically disclose as a feature of his invention the use "a recognition

probability of the at least one further acoustic object is less than the recognition

probability of the previously output acoustic object, but greater than the recognition

probability of other acoustic objects." But the background section of HAAVISTO

(hereinafter referred to as HAAVISTO-background) does describe (col. 2, lines 25-40)

the teaching of patent number 5,222,121 (SHIMADA) where if the user gives a negative

answer (a control command; SHIMADA uses the command "NEXT ONE" col. 5, lines 1-

5) in response to the recognition result the next best result is reproduced, when the

candidates have been arranged in order. The examiner maintains that the ordering of

the best candidate, the next best candidate, and the subsequent candidates is

necessarily based on the degree of match between the user's input and the patterns

used by the recognizer, where the degree of match for any given potential match is

usually indicated by score (or likelihood that there is a match) and the scores (numbers

have an inherent ordering). The higher the score the better the match with the highest

score the being the most likely match.

3.   Appellant asserts on page 7:

> More particularly, Appellant's claims require, among other things,
> that if a first control command to cause a speech recognition algorithm to
> expect repeated utterance of the incorrectly recognized object **and** a
> second control command to **cause** the speech recognition **algorithm to
> output at least one further acoustic object**. Appellant's claims
> additionally define, among other limitations, **a recognition probability of
> the at least one further acoustic object** as being less than the
> recognition probability of the previously output acoustic object, but greater
> than the recognition probability of other acoustic objects. More simply,
> Appellant's presently claimed second control command must **cause** the
> algorithm to output **an acoustic object having a recognition probability
> that is less than the previously output acoustic object, but greater
> than other acoustic objects.** ....

See the arguments under §2, above. As argued above HAAVISTO teaches the

use of multiple commands and HAAVISTO-background (and SHIMADA) teaches the

use of a command ("negative answer" in HAAVISTO co. 2, lines 31-34 or "NEXT ONE"

in SHIMADA col. 5, lines 1-5) to present the next best recognition result.

4.   Appellant asserts on page 8:

> As such, Appellant' s specification supports that, in response to one
> control command, the algorithm expects the word to be repeated, **but in
> response to a second control command** (i.e., "incorrect", in the
> preferred embodiment), **the algorithm offers another object to be
> recognized, without it being necessary for the user to say the object
> again.** This is additionally supported by the language of claims 11 and 13,
> which state that **a second control command causes the speech
> recognition algorithm to output at least one further acoustic object.**
> As noted above, because the claimed **"at least one further acoustic
> object"** is **ranked by probability** (i.e., less than the previously offered
> object, but greater than other objects), the acoustic object that is output **in
> direct response to** (i.e., "causes") to the second control command, **must
> be another attempted offering of the desired acoustic output**, and not
> merely any phrase. Rather, random phrases would not be output by the

algorithm **based on probability**, as required by Appellant's claimed "at
least one further acoustic object".

See the arguments under §2. HAAVISTO-background teaches that if the user

gives a negative answer the phone selects the result that is the second best match to

the recognition (col. 2, lines 28-39). In the same section, HAAVISTO-background also

teaches that the candidates have been arranged in order (necessarily based on

recognition match as argued previously) and thus the candidates output would not be

"random phrases" as suggested by the Appellant's last sentence in the above quoted

paragraph.

5.   Appellant asserts on page 9:

> The recitation of "Number again, please" **cannot** be the result
> outputted in response to Appellant's claimed "second control command".
> More particularly, in **HAAVISTO**, the phrase "Number again, please" does
> not have a **recognition probability of the at least one further acoustic .
> object is less than the recognition probability of the previously
> output acoustic object, but greater than the recognition probability of
> other acoustic objects**, as required of the "at least one further acoustic
> object" of Appellant's claims 11 and 13. As such, the phrase "Number
> again, please output by the algorithm in **HAAVISTO** cannot be analogized
> to Appellant's claimed "at least a further acoustic object" that Appellant's
> claimed "second control command" **causes** to be outputted.

See arguments above in §2. As argued previously, HAAVISTO teaches the use

of multiple commands (col. 6 and Table 2), and HAAVISTO-background teaches the

use of the next best candidate in response to a negative command (col. 2, lines 30-39).

Appellant further argues on page 10 that "**HAAVISTO** would **not** motivate a person of ordinary skill in this art to **add** a system, such as the prior art system disclosed in the cited lines of col. 2, of HAAVISTO, to the system disclosed in the cited lines of col. 6. of HAAVISTO." In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the suggested combination results in "an improvement (of the human interface) when selecting from several possible recognition results (HAAVISTO, col. 2, lines 27-32).

Furthermore, "[T]he test [for obviousness] is what the combined teachings of the references would have suggested to those of ordinary skill in the art." *In re Keller*, 642 F.2d 413, 425 (CCPA 1981). "The combination of familiar elements according to know methods is likely to be obvious when it does no more than yield predictable results." *KSR Int'l Co. v. Teleflex Inc.*, 127 s. Ct. 1727, 1739 (2007); id. at 1739-40 ("if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar device in the same way, using the technique is obvious unless its actual application is beyond his or her skill"). In this case, it would have been obvious to add the "next best" feature to HAAVISTO as a way to select the correct recognition result if the first result present was incorrect.

6.   Appellant asserts on page 11:

    **B. HAAVISTO fails to teach or suggest, among other
limitations of Appellant's claims determining a recognition
probability of the at least one further acoustic object is less than the
recognition probability of the previously output acoustic object, but
greater than the recognition probability of other acoustic objects, as
required by Appellant's independent claims 11 and 13.**

7.   See the arguments in §2, above. HAAVISTO-background (and SHIMADA)
teaches an ordering of the recognition results, where the next best candidate can be
selected. The examiner maintains that there is an inherent ordering in the speech
recognition process where the potential matches can be ranked as to the degree of
match (see Markowitz, p. 36, Fig. 2.7, the spoken input is compared to templates and a
similarity assessment is performed resulting in a distance metric). The degree of match
is represented by a number which might be called a score, probability, distance metric,
etc. Since the scores are numbers there is an inherent ordering (e.g., 0.9 > 0.75 > 0.60)
and given that the best match is the highest score it follows that the next best match
would be the next lowest score. If the user, on hearing the results of the first best match,
determines that it is incorrect the next (very obvious) choice would be the next best
match (i.e. the match with the next lowest score).

8.   Appellant asserts on page 12

    Previous Office Actions have relied on U.S. Patent. No. 5,222,121
to Shimada ("**SHIMADA**"), in order to find the limitation of Appellant's
independent claims that is missing from **HAAVISTO**. However, as it
presently stands, the Examiner now contends that this feature is "well
known in the art" and disclosed in col. 2 of **HAAVISTO**, lines 28-39, which,

Appellant notes, is merely a reference to the **SHIMADA** patent. Thus, the
Examiner apparently withdrew the prior art rejection of record, which
combined **HAAVISTO** with **SHIMADA**, in order to assert, solely, the
HAAMISTO reference, while asserting the teachings of **SHIMADA**, as set
forth in the background section of **HAAVISTO**. Appellant respectfully
disagrees.

This was done as an attempt to clarify the rejections based on the teachings of

SHIMADA, by referring to summary of SHIMADA given in HAAVISTO-background (see

Office Action dated 1/22/2007, p. 7).

9.   Appellant asserts on page 14:

However, while it is indeed true that **degrees of recognition** may
be determined between an input utterance and potential matches, as used
in the conventional art, there is simply no disclosure in either **SHIMADA** or
HAAVISTO as to **how the candidates are ranked in order to determine
the degree of recognition**. Rather, as discussed above, **SHIMADA**
simply states that a user can call **up the next lower candidate** by
entering a voice command "NEXT ONE." That is, when the name of the
first-place candidate recognized is different from the desired name, the
user can call up a number associated with the name of the **lower place
candidate** by entering a command. See, for example, col. 5 of **SHIMADA**,
lines 15 - 20. Again, **SHIMADA** and **HAAVISTO** fail to provide any
teaching, suggestion or motivation, or any discussion, at all, of **ordering,
degrees** of recognition, **probabilities** or other similar features.

The Appellant admits that "it is indeed true that degrees of recognition may be

determined between an input utterance and potential matches" but then goes on to

state that "there is simply no disclosure in either SHIMADA or HAAVISTO as to how the

candidates are ranked in order to determine the degree of recognition." The appellant

has this reversed; the degree of recognition determines the ranking not vise versa. That

is the degrees of recognition between the utterance and the patterns are determined

which are represented by numbers (metrics) and these <u>numbers have an inherent</u>

<u>order</u>.

10.   Appellant asserts beginning on page 14:

>   However, in the **final Office Action**, the Examiner implies **that the
> mere fact a recognition occurs** means that there is inherently some form
> of ordering or degree of recognition. A review of the **MARKOWITZ**
> reference shows that there are different methods of voice recognition, for
> example, template matching, acoustic- phonetic and stochastic
> processing. While a degree of recognition and/or ordering may indeed
> occur, *because of the methods applied,* **there is no disclosure of the
> recognition** in **MARKOWITZ,** and **MARKOWITZ** *also fails to teach or
> suggest, among other things, the particular ranking of* **probabilities**
> *required by Appellant's claimed invention.* Among other things,
> **HAAVISTO, SHIMADA** and **MARKOWITZ** fail to teach, suggest, motivate,
> or provide any consideration of a recognition probability of the at least one
> further acoustic object is less than the recognition probability of the
> previously output acoustic object, but greater than the recognition
> probability of other acoustic objects, as required by Applicant's claims.
> (Italics added)

Markowitz was introduced (in the arguments) to give background information on

the recognition process and states that the matching process generates an overall

similarity assessment (usually called the distance metric) of potential matches (p. 36,

bottom of the first paragraph, Fig. 2.7). This distance metric corresponds to the

Appellant's probability (see specification p. 2, lines 34-37, "the speech recognition

algorithm determines recognition probabilities $\{p1, p2, ..., pn\}$ with the property $1 > p1$

$>= p2 >=, ..., >= pn >$). Also note that the similarity metric is a number and numbers

have inherent ordering.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the

Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

V. Paul Harper

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